

(7.5) Using Trig Ratios to Determine Side Length & Angle Measure

Example 1: Solve for x to 1 decimal places.

SOH CAH TOA

$\sin 45^\circ = \frac{1}{x}$
 $0.7071 = \frac{1}{x}$
 $x(0.7071) = 1$
 $\frac{x}{0.7071} = \frac{1}{0.7071}$
 $x = 1.4$

$\sin 45^\circ = \frac{1}{x}$
 $x = \frac{1}{\sin 45^\circ}$
 $x = \frac{1}{0.7071}$
 $x = 1.4$

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Example 2: Solve for x to the nearest degree.

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$\cos x = \frac{6}{8}$
 $\cos x = 0.7500$
 $x = \cos^{-1}(0.7500)$
 $x = 41^\circ$

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Example 3: A wheelchair ramp 8.2 m long rises 94 cm. Find its *angle of inclination* to the nearest tenth of a degree.

HINT: Start with a diagram!

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Example 4: The sun's rays form an angle of 68° with the ground when a tree casts a shadow 14.3 m long. How tall is the tree (to one decimal place)?

SOH CAH TOA

$\tan 68^\circ = \frac{h}{14.3}$
 $h = 14.3 \tan 68^\circ$
 $h = 14.3(2.4751)$
 $h = 35.4$

The tree is 35.4 m tall.

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Angle of Elevation vs. Angle of Depression

Angle of Elevation

Angle of Depression

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